

How to Create a More Efficient Utility Enterprise with

Engineering Information Management



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How EIM Improves Business Performance and Strategy

As utilities evolve toward more nimble, efficient modes of business and operations, significant value can emerge from what might seem like unlikely places—such as how engineering information about assets and systems is managed.

Many utilities view engineering information management (EIM) solutions as a way to realize day-to-day efficiencies and benefits for engineering staff. However, looking beyond engineering, a much broader and larger return on this investment can be realized from operations and maintenance departments.

In the big picture, robust EIM can improve a utility's business performance and strategy implementation by:

Reducing risk, especially of outages and costly compliance problems.

Increasing reliability and speeding outage recovery—which increases customer and regulator satisfaction, and also yields significant cost savings.

Improving information security around critical infrastructure and business strategy through secure document storage and access control.

Accelerating the completion and handover of capital projects.

Supporting regulatory approval for integrated resource plans and capital projects.

Enabling strategic visibility into equipment and systems.



Meanwhile, on a day-to-day basis, EIM also provides these considerable benefits:

Making it easy and fast to consistently access the right version of the right document.

Enhancing the accuracy and efficiency of projects, maintenance and repairs.

Automating workflows to accelerate project approvals.

Reducing engineering change orders, a considerable cost for many utility projects.

Fostering better collaboration between departments within the utility and with vendors.

Preserving the knowledge and context of experienced staff who are aging out of the utility workforce.

Leveraging the full value of EIM can yield competitive and strategic advantages.

Efficient, effective utilities tend to have more success attracting investors, retaining customers and building new revenue streams.

EIM also can serve as a springboard to address what has been, for many utilities, a rather daunting challenge: Integrating data from disparate systems, such as for geographic information (GIS), enterprise resource planning (ERP), work order management and outage management (OMS). One EIM solution that offers many out-of-the-box integrations is Adept by Synergis Software.





Reducing Risk Through Better Information Access

The risks that utilities face are changing fast—even sweeping the historically change-resistant realm of utility regulation. For instance, the most common way for utilities to operate currently is either under traditional cost-of-service regulation or under an elected board. But, according to [Utility Dive's State of the Electric Utility survey](#), some level of performance-based regulation is expected to become the most common regulatory model within the next few years. This shift will affect every aspect of utility business and operations, and significantly alter how utilities view opportunities and risk.

To understand and manage this shifting landscape of risk, utilities will require reliable access to accurate information. This can be a challenge, given the traditional ways that many utilities have managed information.

"For a long time, we didn't have any real version control for our engineering documents. We'd often have multiple people making changes to the same document, overwriting each other, which caused confusion, slowed everything down and introduced the possibilities of errors in the field," said Melissa Hazelwood, document control technician for Nova Scotia Power.



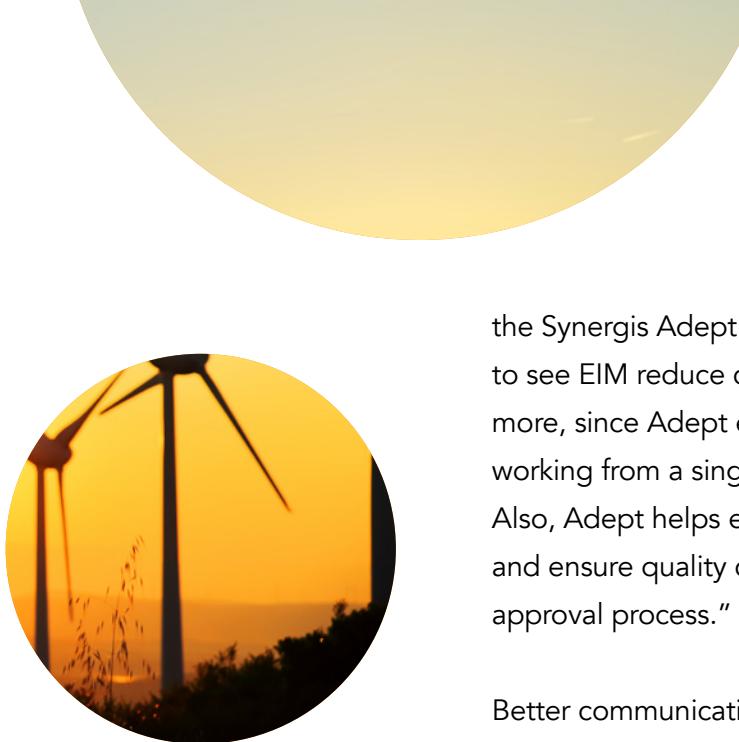


Achieving a higher level of control and certainty can reduce the risk that work might be performed incorrectly or need to be redone.

"We've had situations where one contractor installs conduit, but the information about that change doesn't get shared correctly. Then another contractor goes right in and rips it out," said Bernie Voges, substation design

engineer with Hoosier Energy, which includes 18 member cooperative utilities in Indiana. "We dealt with such miscommunications all the time. But since implementing EIM, it happens much less often."

"Engineering change management represents a surprisingly significant opportunity for EIM to decrease risk," said Scott Lamond, vice president of marketing and business partnerships at Synergis Software, creator of



the Synergis Adept EIM solution. "It's typical to see EIM reduce change orders by 25% or more, since Adept ensures that everyone is working from a single version of the truth. Also, Adept helps enforce design standards and ensure quality control by automating the approval process."

Better communication, faster access and fewer mistakes with engineering information can provide larger benefits across the utility. In particular, EIM can speed the completion of both ordinary operations or repairs and major capital projects. This not only enhances cost effectiveness; it also helps control wholesale power purchase costs, provides faster outage recovery and prevents outages (thus boosting reliability indicators), and limits asset downtime.

Engineering information can even be a consideration in the sale of power plants. When a natural gas-fired power plant in



Carville, Louisiana, changed hands a few years ago, the new owners discovered that crucial engineering documents supporting key processes at this revenue-producing facility were neither well organized nor easily accessible.

"The previous plant owners basically took all their documentation and dumped it into folders on a server," explained Chris Klibert, senior technical specialist for Carville Energy, LLC. This led to significant additional expense and delays, as well as problems that continued to surface for months after the sale of the plant.

Klibert observed that a lack of access or certainty about engineering information increases risks to project schedules and

worker safety—especially during lock out/tag out procedures. For example, if a piping and instrument diagram is out of date, it can delay bringing a turbine back online after mandated maintenance and inspection.

EIM also reduces risks associated with compliance with regulations and contract terms. Klibert noted that the Carville plant has contracts to provide both steam and power to third parties, and the information now stored in its EIM system is a crucial part of the audit trail. In addition, the organization plans to manage and track information about both current regulations (including associated compliance procedures) and prior compliance reports





in Adept. This will ensure that Carville's regulatory compliance process is faster, more complete and simpler to audit.

Adept maintains a complete audit trail for all engineering documents, making it easy to see who accessed a file and which actions they took at what time. Adept also provides granular control over document access: Administrators can specify who can access which kinds of information, and which actions they are authorized to take. Adept also provides a critical layer of security for all files — an advantage over the still-common utility practices of placing files in Windows folders on a server or distributing them via email.

Currently, security is the primary concern of utility executives. For the last two years, over 80% of industry executives and professionals rated it as a top concern in the State of the

Electric Utility survey. Many utilities reported that they were struggling to implement effective cybersecurity. Meanwhile, it's still common for utilities to internally share critical business strategy information using non-secure channels. As utilities navigate the path toward greater security of their digital information, facilities and assets, the secure document storage and access control provided by EIM (and document management, in general) can provide a foundational layer of security control for business and design documents.

"At most utilities, there's no easy way to show that information is moving through secure channels," said Lamond. "That can be especially frustrating for executives who have to be accountable to boards, investors and regulators."



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The Return on EIM Investment

The return on investment (ROI) for EIM is derived from several factors. Some of these are fairly obvious. But others warrant deeper inquiry.

For example, capital-intensive projects—such as building a new substation or undergrounding power lines—rely extensively upon engineering information. This can be used for developing RFPs, presenting budgets to internal executives and regulators, coordination between departments and with contractors, and more. Adept can provide strategic visibility into integrated data from multiple systems for enterprise planning and budgeting.

"EIM can automate any document-centric workflow process, routing information through approvals across departments and sites, and keeping the process on track through notifications and alerts. This helps the utility operate as a more efficient organization," said Lamond.

"Also, utilities often have staff whose full-time job is assembling, receiving and managing transmittals," Lamond continued. "Adept helps automate the creation and management of document transmittals. This simplifies and speeds the process of gathering relevant documents, while ensuring that the correct





versions are included. If CAD files are part of a transmittal, all file relationships are included. Adept also maintains a record of what was sent to whom."

Increasingly, utilities outsource key functions to contractors, such as maintenance. "If the information about your equipment is well organized and managed, that makes it easier to work with contractors and to improve outcomes," said Lamond. "This also helps contractors. If your equipment is accurately pre-catalogued, they don't need to spend your money or their time gathering data about the precise location, configuration and condition of currently installed equipment. This fosters an overall better working relationship."

EIM can even help utilities prevent outages. Incorrect or outdated information about field equipment can lead to suboptimal grid management decisions, which can contribute to outages. For instance, if a grid operator routes power through transformers or circuits without understanding the correct specifications or conditions of that equipment, outage risk increases. Avoiding a single outage of an hour might more than compensate for a utility's entire investment in EIM.

The value of EIM becomes most apparent during dire conditions, such as major storms, wildfires or floods. Lamond explained that during Hurricane Katrina in 2005, the U.S. Coast Guard integrated engineering

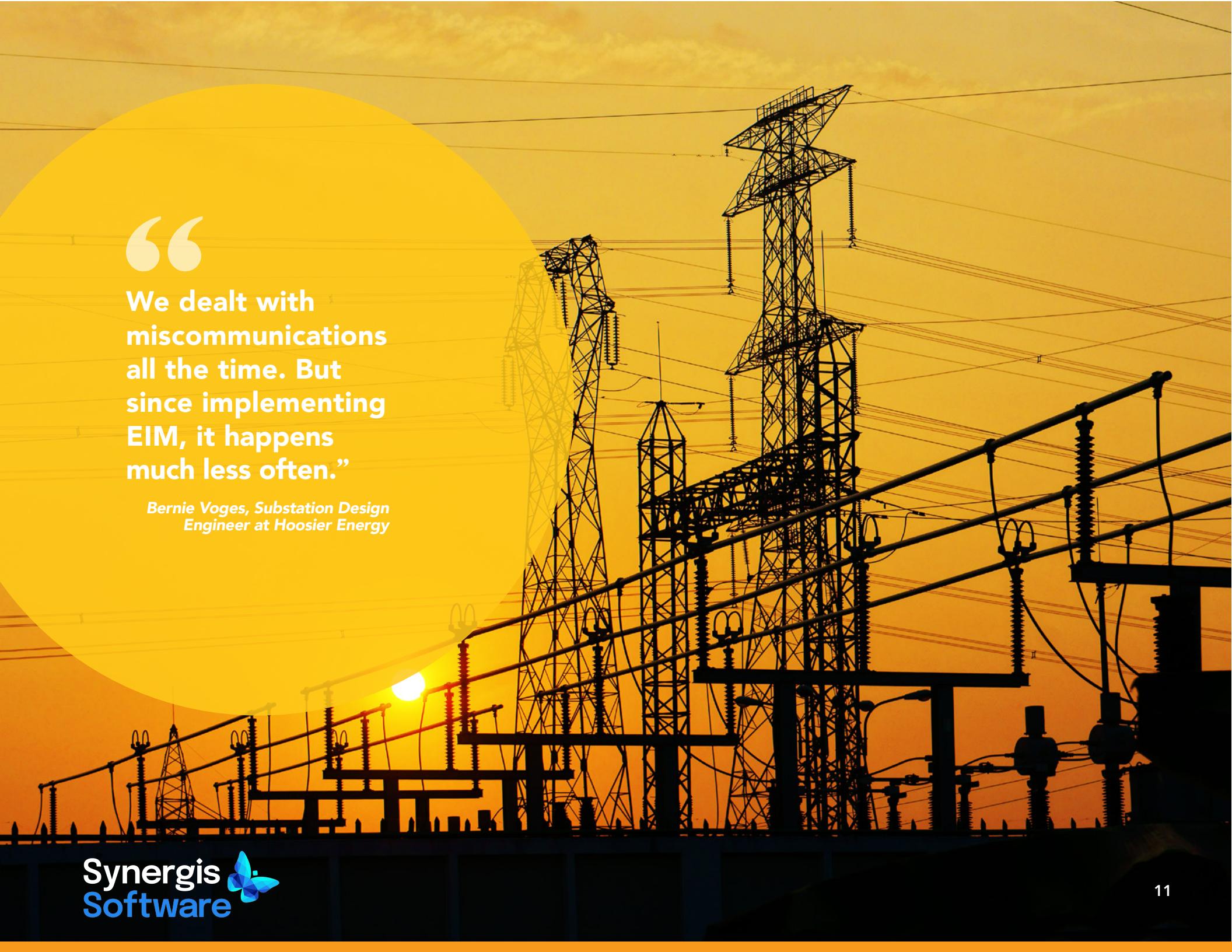
information from its Adept EIM system with systems for geographic information (ESRI GIS) and asset management (Maximo). "They could zoom in on impacted areas, identify their affected facilities, find all related drawings quickly to anticipate access and repair issues, and respond faster," said Lamond. "This is not very different from the kinds of emergency operations utilities often must undertake."

Furthermore, when more utilities deploy EIM, they are better prepared to offer mutual aid during emergencies. This opportunity is receiving increasing attention at the national level because protecting and restoring critical infrastructure during extreme weather is a growing concern.

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Conclusion: How to Assess the Potential Value of EIM

As utilities ponder whether, and how, EIM might add value to their business and operations, it's useful to consider these questions:

- 1** Many utilities seek to enhance business flexibility by bridging entrenched internal silos. How might comprehensive information management, simplified collaboration across departments and automated workflow improve how your utility functions, both internally and externally?
- 2** Utility executives increasingly rely on dashboards, reports and analytics to understand their current business and operational status, as well as to spot opportunities for growth and change. How much does the information your executives need depend on reliable, timely visibility into utility infrastructure?

- 3** What costs have been associated with outages, unexpected repairs and compliance problems at your organization in the last several years? Would better access to engineering information have prevented some of those incidents?
- 4** How does your utility currently handle the process of selecting and partnering with vendors and contractors? How might streamlining these collaborations benefit your utility?

Every utility faces a unique set of circumstances and limitations related to engineering information. By considering these questions, and perhaps running some preliminary numbers with outside experts, you might uncover compelling opportunities from an aspect of the business that rarely gets the attention it deserves.



Synergis Software has successfully implemented Synergis Adept Engineering Information Management for dozens of utilities including: Con Edison, Eversource Energy, San Diego Gas & Electric, South Carolina Electric & Gas, Northwestern Energy, Nova Scotia Power, Great River Energy, Platte River Power Authority, Hoosier Energy, Carville Energy, Lansing Board of Water & Light, Rochester Public Utilities and many others.

For more information about how Engineering Information Management can improve the efficiency of your utility, please call 800.836.5440 to schedule a personalized product demonstration or ROI development session to understand the value Adept can bring to your organization.

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